PROCEDURES
COMBUSTIBLE GAS INDICATORS (CGI)

3.0 PURPOSE

The combustible gas indicator unit (CGI) is utilized to center, determine leakage spread and to classify gas leakage. The unit may be used for gas leakage investigations and leakage surveys.

Operator and contract personnel using CGI's shall check and record calibration regularly.

3.1 SCOPE

The combustible gas indicators are designed to:

A. Determine whether gas is present in a manhole, basement, underground or other confined space.
B. Provide means for classifying leaks.
C. Check for completion of a purge.
D. Center leaks.
E. Determine leakage spread

3.2 COMBUSTIBLE GAS INDICATOR

A. The combustible Gas Indicators is a two-scale instrument.
   1. One scale indicates gas from 0% to 5%, or percent of Lower Explosive Level (L.E.L).
   2. The second scale reads gas concentration directly from 0% to 100% gas in air.

B. Technician must check calibration on the CGI units regularly and document the results. **Follow the specific manufacturer's procedures**.

C. Zero the unit prior to each usage.

D. Check bar holes, cracks and other possible vent points.

E. Determine leakage spread **Refer to Section J-4**

F. Center and classify leakage **Refer to Sections J-5 & J-6**

G. Should leakage be determined to be potentially hazardous, take appropriate action to

protect life and property **Refer to Section B-3 & Section Q**

H. It is important to clear the unit (pump air through the unit) between each check.

I. When using only the combustible gas indicator unit for leakage survey, good judgment should be used to determine the number of bar holes to provide an adequate survey and perimeter of leakage migration.

J. Combustible gas indicators can be used to differentiate natural gas from condensable hydrocarbons (gasoline) with the installation of a hydrocarbon filter (charcoal) on the instrument

3.3 MSA GASCOPE

A. Leak, flow and calibration checks shall be made not less frequently than **monthly**.

1. Calibration Check:
    a. Turn unit on and set to LEL range
    b. In fresh air, squeeze the aspirator bulb 8-10 times
    c. Unit must reset to zero on both scales
    d. On LEL scale check reading against know sample of gas 2% methane
    e. On gas scale check reading against 100% gas (pipeline gas may be used)
2. Leak Check:
    a. Seal inlet fitting
    b. Squeeze aspirator bulb
    c. Immediately seal outlet of aspirator with thumb
    d. Bulb should remain deflated for a minimum of 10 seconds
    e. If not repair is required
3. Flow Check:
    a. Squeeze aspirator
    b. Bulb should re-inflate within 1 to 2 seconds
    c. If not, replace filter
    d. Disconnect aspirator bulb tubing from outlet fitting and remove regulating orifice to verify that it is open
    e. I clogged, insert no. 23 gauge wire through the opening
    f. Reconnect and recheck
    g. If aspirator bulb still does not inflate in 1 to 2 seconds, further repair is required

B. Do not operate on LEL in oxygen deficient (less that 10% oxygen) area as the meter may not give accurate readings

C. This instrument is not intended for testing mixtures of hydrogen, acetylene, or other combustible gases, in which the oxygen content exceeds that of normal air.

D. Even though the instrument responds to such combustibles gases as propane, acetylene, gasoline or solvents, it provides accurate measurements of only the specific gas for which it is calibrated.

E. The use of a standard cotton filter in the sampling line is recommended to protect the instruments for possible damage caused by sampling leaded petroleum products. Change the cotton filter

F. An activated charcoal filter may be installed in place of the cotton filter to separate petroleum products being sampled. If the readings are less than those indicated without the charcoal filter, then the sample contains petroleum.

G. **CGI Model 62S Operation** (Manually aspirated unit)

1. Set range switch to LEL
2. Set on/off switch to on
    - BATT indicator should be well into white
    - READY should turn on within approximately 4 seconds. If not, replace batteries
3. Squeeze aspirator bulb 8 to 10 times in fresh air to purge the instrument. Bulb should fully re-inflate within 2 seconds
4. Lift and turn outer sleeve and adjust LEL control to zero indication on meter
5. Attach sampling line, probe and filter cartridge if necessary
6. Set RANGE switch to GAS
7. When READY indicator turns on, Lift and adjust GAS ZERO control to obtain zero indication on meter.
8. In area(s) to be tested, squeeze aspirator bulb nine or ten times to draw adequate sample into instrument.
    - When the needle stabilizes, the meter indicates the concentration of gas in air in percent by volume.
    - Meter indications are valid only when READY indicator is on.
9. When wet weather conditions exist, caution should be taken to prevent

liquids from being drawn into the instrument.
- Do not allow end of probe or sampling line to touch liquids
- Use closed end probe
- Install line trap

10. If meter indication is less than 5, set range to LEL. The meter now indicates the percent LEL.
11. If indications of gas leakage are present:
    - Center leak **Refer to Section J-6**
    - Grade Leak **Refer to Section J-5**
12. Take appropriate action to protect the general public **Refer to Section B-3 & Section Q**
13. Record all readings and findings on appropriate forms and maps

H. Refer to the equipment manufacturers operating instruction manual for further detail in operating and maintaining this equipment.

3.4 Bascom-Turner Gas Ranger

A. The Gas Ranger is an automatic CGI
1. Auto Zero
2. Auto Calibration
3. Auto Sampling
4. Auto self-tests

B. These Detectors are capable of detecting natural gas, carbon monoxide, oxygen and H_2S

C. Check the instrument you are utilizing to determine its exact capabilities

D. Operation
1. Turn the unit on
2. The unit will run trough its automatic start up functions
3. If the unit is not operating properly it can not complete this start up
4. Pump check:
   - Block the inlet probe, if *"bloc"* does not appear on the display
   - Tighten connections and retest
   - If *"bloc"* still does not appear, block directly at inlet fitting
   - If *"bloc"* still does not appear, do not use the unit until further repair is

completed

5. If everything checks out unit is ready
6. Check and clean dust and water-block filters regularly by removing and tapping it on a hard surface. Do not insert object as this may damage the filter.
7. Filters typically need replacement twice a year

E. Test and Calibration: Perform monthly
1. Use know gas sample consisting of 2.5% methane
2. Always pure the unit in gas free environment when complete

F. Set range to gas and begin leak investigation